

Application No. 10/801,826

In the claims

Please amend claim 5 as follows:

- 1 1. (original) An aperture limiting element that has a wavelength selectivity, comprising:
2 an aperture that is an open space of a specified size formed in a substrate; and
3 in an area outside the aperture and that surrounds the aperture, a light filter is provided
4 wherein light of a specified wavelength λ_1 is transmitted, and light of a wavelength λ_2 is
5 prevented from passing straight through.
- 1 2. (original) The aperture limiting element according to claim 1, wherein:
2 the light of wavelength λ_2 that is prevented from passing straight through is blocked, and
3 $\lambda_1 < \lambda_2$.
- 1 3. (original) The aperture limiting element according to claim 1, wherein
2 the light of wavelength λ_2 that is prevented from passing straight through is diffracted
3 laterally, and $\lambda_1 < \lambda_2$.
- 1 4. (original) The aperture limiting element according to claim 1, wherein the construction is such
2 that the difference in the optical path length of light of the first wavelength λ_1 that is transmitted
3 by the substrate and said filter versus the optical path length of light of the first wavelength λ_1
4 that passes through the open space of said aperture is $m \cdot \lambda_1$, where m is a positive integer.
- 1 5. (currently amended) An aperture limiting element that has wavelength sensitivity comprising:
2 an aperture that is an open space of a specified size formed in a substrate;
3 in an area of the substrate that is outside the aperture, there is constructed a first light
4 filter in an inner first region that transmits light of first and second wavelengths λ_1 and λ_2 ,
5 respectively, and blocks light of a third wavelength λ_3 , where $\lambda_1 < \lambda_2 < \lambda_3$; and

Application No. 10/801,826

6 in an area of the substrate that is outside the aperture and the inner first region, and that
7 surrounds the aperture, there is constructed a second light filter in an outer second region that
8 transmits light of the first wavelength λ_1 and ~~blocks~~ prevents light of the second and third
9 wavelengths λ_2 and λ_3 , respectively, from passing straight through.

1 6. (original) An aperture limiting element that has a wavelength sensitivity comprising;
2 an aperture that is an open space of a specified size formed in a substrate;
3 in an area of the substrate that is outside the aperture, there is constructed a first light
4 filter in an inner first region that transmits light of first and second wavelengths λ_1 and λ_2 ,
5 respectively, and blocks light of a third wavelength λ_3 , where $\lambda_1 < \lambda_2 < \lambda_3$; and
6 in an area of the substrate that is outside of the inner first region, there is constructed a
7 second light filter in an outer second region that transmits light of the first wavelength λ_1 , and
8 diffracts one and blocks the other of light of the second and the third wavelengths λ_2 and λ_3 ,
9 respectively.

1 7. (original) The aperture limiting element according to claim 5, wherein the construction is such
2 that:

3 the difference in the optical path length for light of the first wavelength λ_1 that is
4 transmitted by the substrate and said filter in said inner first region versus the optical path length
5 for light of the first wavelength λ_1 that passes through the open space of said aperture is $p \cdot \lambda_1$,
6 where p is a positive integer;

7 the difference in the optical path length for light of the first wavelength λ_1 that is
8 transmitted by the substrate and said filter in said outer second region versus the optical path
9 length for light of the first wavelength λ_1 that passes through the open space of said aperture is q
10 $\cdot \lambda_1$, where q is a positive integer; and

11 the difference in the optical path length for light of the second wavelength λ_2 that is
12 transmitted by the substrate and said filter in said inner first region versus the optical path length
13 for light of the second wavelength λ_2 that passes through the open space of said aperture is $r \cdot \lambda_2$,
14 where r is a positive integer.

Application No. 10/801,826

1 8. (original) The aperture limiting element according to claim 6, wherein the construction is such
2 that:

3 the difference in the optical path length for light of the first wavelength λ_1 that is
4 transmitted by the substrate and said filter in said inner first region versus the optical path length
5 for light of the first wavelength λ_1 that passes through the open space of said aperture is $p \cdot \lambda_1$,
6 where p is a positive integer;

7 the difference in the optical path length for light of the first wavelength λ_1 that is
8 transmitted by the substrate and said filter in said outer second region versus the optical path
9 length for light of the first wavelength λ_1 that passes through the open space of said aperture is q
10 $\cdot \lambda_1$, where q is a positive integer; and

11 the difference in the optical path length for light of the second wavelength λ_2 that is
12 transmitted by the substrate and said filter in said inner first region versus the optical path length
13 for light of the second wavelength λ_2 that passes through the open space of said aperture is $r \cdot \lambda_2$,
14 where r is a positive integer.

1 9. (original) The aperture limiting element according to claim 1, wherein the substrate has the
2 shape of a truncated cone.

1 10. (original) The aperture limiting element according to claim 9, wherein the substrate is formed
2 of a plastic material.

1 11. (original) The aperture limiting element according to claim 3, wherein:

2 the ratio of the intensity of the zero-order diffracted light of the first wavelength λ_1
3 divided by the light of the first wavelength λ_1 that is transmitted by the substrate is 85% or
4 higher; and

5 the ratio of the intensity of the zero-order diffracted light of the second wavelength λ_2
6 divided by the light of the second wavelength λ_2 that is transmitted by the substrate is less than

Application No. 10/801,826

7 the ratio of the intensity of a specified diffracted order of light of the second wavelength λ_2
8 divided by the intensity of light of the second wavelength λ_2 that is transmitted by the substrate.

1 12. (original) The aperture limiting element according to claim 3, wherein the light filter is a
2 diffraction grating having concentric circles of diffractive structures, as viewed in a direction
3 along the optical axis of the light filter.

1 13. (original) The aperture limiting element according to claim 3, wherein the light filter is a
2 diffraction grating having diffractive structures that, in cross section, have a staircase shape.

1 14. (original) The aperture limiting element according to claim 8, wherein the diffraction grating
2 diffracts light of the second wavelength λ_2 or of the third wavelength λ_3 in a direction that
3 initially diverges from the optical axis.

1 15. (original) The aperture limiting element according to claim 13, wherein the diffraction
2 grating diffracts light of the second wavelength λ_2 in a direction that initially diverges from the
3 optical axis.

1 16. (original) An optical pickup device that includes an objective lens, an optical pickup element,
2 and the aperture limiting element according to claim 1.

1 17. (original) An optical pickup device that includes an objective lens, an optical pickup element,
2 and the aperture limiting element according to claim 2.

1 18. (original) An optical pickup device that includes an objective lens, an optical pickup element,
2 and the aperture limiting element according to claim 3.

1 19. (original) An optical pickup device that includes an objective lens, an optical pickup element,

Application No. 10/801,826

2 and the aperture limiting element according to claim 4.

1 20. (original) An optical pickup device that includes an objective lens, an optical pickup element,
2 and the aperture limiting element according to claim 5.

1 21. (original) An optical pickup device that includes an objective lens, an optical pickup element,
2 and the aperture limiting element according to claim 6.

1 22. (original) The optical pickup device according to claim 16, wherein the objective lens is a
2 positive lens having a convex surface on the light-source side arranged so that the convex surface
3 is inserted into the open space of the aperture.

1 23. (original) The aperture limiting element according to claim 5, wherein the substrate has the
2 shape of a truncated cone.

1 24. (original) The aperture limiting element according to claim 6, wherein the substrate has the
2 shape of a truncated cone.

1 25. (original) The aperture limiting element according to claim 23, wherein the substrate is
2 formed of a plastic material.

1 26. (original) The aperture limiting element according to claim 24, wherein the substrate is
2 formed of a plastic material.

1 27. (original) The aperture limiting element according to claim 6, wherein:
2 the ratio of the intensity of the zero-order diffracted light of the first wavelength λ_1
3 divided by the light of the first wavelength λ_1 that is transmitted by the substrate is 85% or
4 higher; and

Application No. 10/801,826

5 the ratio of the intensity of the zero-order diffracted light of the second wavelength λ_2
6 divided by the light of the second wavelength λ_2 that is transmitted by the substrate is less than
7 the ratio of the intensity of a specified diffracted order of light of the second wavelength λ_2
8 divided by the intensity of light of the second wavelength λ_2 that is transmitted by the substrate.

1 28. (original) The aperture limiting element according to claim 6, wherein the light filter is a
2 diffraction grating having concentric circles of diffractive structures, as viewed in a direction
3 along the optical axis of the light filter.

1 29. (original) The aperture limiting element according to claim 6, wherein the light filter is a
2 diffraction grating having diffractive structures that, in cross section, have a staircase shape.

1 30. (original) The optical pickup device according to claim 20, wherein the objective lens is a
2 positive lens having a convex surface on the light-source side arranged so that the convex surface
3 is inserted into the open space of the aperture.

1 31. (original) The optical pickup device according to claim 21, wherein the objective lens is a
2 positive lens having a convex surface on the light-source side arranged so that the convex surface
3 is inserted into the open space of the aperture.

1 32. (original) The aperture limiting element according to claim 29, wherein the diffraction
2 grating diffracts light of the second wavelength λ_2 or of the third wavelength λ_3 in a direction
3 that initially diverges from the optical axis.